Space Weather Forecast

Issued on Saturday, 20 April 2024 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Moderate flares likely and a slight chance of Strong flares. Slight chance of G1/Minor Storms, mainly Days 2-3 (21-22 Apr) due to possible glancing blows from Coronal Mass Ejections (CMEs).

Solar Activity: Moderate, with one Moderate flare observed at 19/1306 UTC from on the number of sunspots in in the south centre disc. There are currently thirteen regions, however the main activity has been from the southern central disc complex. Slow growth has been evident in the most complex of these, along with a mixed magnetic polarity, while the easternmost region continues to show some decay. Growth is also evident with the re-emergence of a small sunspot to the west, along with another sunspot to the southwest of this region, and also a region to the east of it. Across the rest of the disc, minor growth and decay has been observed, however the majority of regions remains small and simple. The exception being the region in the north-centre, which is moderately sized, but also of a simple bipolar configuration.

No clear Earth-directed coronal mass ejections (CMEs) have been observed, however a couple of eruption from the southern sunspots were observed and assessed as likely either missing, or giving very weak glancing impacts at most. A CME was also identified from the Moderate flare, however this was faint with limited imagery and was hard to isolate from other not Earth-directed CMEs. Consequently analysis is still on going.

Solar Wind / Geomagnetic Activity: The solar wind showed ongoing CME influence, which arrived around 0452 UTC on 19 Apr, along with the onset of the fast wind of a coronal hole. Speeds increased from near background 400 km/s to peak elevated 480-520 km/s from 19/2100-20/0600 UTC, before easing back to be slightly elevated at around 450km/s. Interplanetary Magnetic Field (IMF), was Strong at first but erratically eased to be weak from 20/0000 UTC. The north-south component was Strong negative (southward) at first but slowly rotated to be weakly positive (northward) from 20/2100 UTC. This gradually rotated back to weak negative values after 20/0600 UTC. Geomagnetic activity saw a G1 Minor Storm 19/1200-1800 UTC and G3 Strong storm 19/1800-2100UTC, though the latter was originally reported at G2 (Kp5-7). Activity subsequently eased to Quiet to Active from 19/2100 UTC (Kp2-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no Solar Radiation Storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is forecast with isolated Moderate-class flares expected and a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: There are a number of CMEs expected to pass near Earth, originating from the southeast disc between 18-19 Apr, with the potential for weak glancing impacts on Days 2-3 (21-22 Apr). Otherwise ongoing fast wind influence is expected to gradually and erratically ease through this period. Geomagnetic activity is expected to be Quiet with Unsettled intervals for much of the period, however any additional enhancement from CME arrivals will bring the potential for Active to G1 Minor Storm intervals, perhaps most likely later on day 2 or day 3 (21-22 Apr).

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Met Office Space Weather Forecast

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no Solar Radiation storms occurring.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	10	20	20	5
Strong	G3	Yes	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	75	75	75	75
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	15	15
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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